Original Article

Biomedical Waste Management: A study of knowledge, attitude and practice among health care personnel at tertiary care hospital in Rajkot

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ABSTRACT

Background: Bio medical waste (BMW) collection and proper disposal has become a significant concern for both the medical and general community. Effective management of biomedical waste is not only a legal necessity but also a social responsibility.

Objective: To know the knowledge, attitude and practice among health care personnels working in tertiary care centre.

Methods: The study was conducted from January 2013 to June 2013. It was a descriptive observational hospital based cross sectional study. Study participants included the resident doctors intern doctors, nursing staff, laboratory technicians, ward boys and sweepers working in the institute who are dealing with BMW. The study was conducted by using pretested, semi-structured proforma. The data was tabulated and interpretation was done by using percentages through Epi Info 3.5.1 software.

Results: It included 123 resident doctors and interns, 92 nurses, 13 laboratory technicians, and 54 sanitary staff. Majority of study participants belongs to 21-30 years (61%) age group. More than two third of study participants working in hospital from 1 to 5 years. Only 44.3% study participants received training for bio medical waste management. HIV (74.47%) and Hepatitis B (56.03%) were the main infectious diseases transmitted by the bio medical waste.

Conclusion: The importance of training regarding bio medical waste management cannnot be overemphasized, lack of proper and complete knowledge about bio medical waste management impacts practices of appropriate waste disposal.

Keywords: bio medical waste, knowledge, attitude, practice, health care personnel

INTRODUCTION

According to Bio-Medical Waste (management and handling) rules, 1998 of India, Bio Medical Waste (BMW) means any solid, fluid, or liquid waste including its containers and any intermediate product which is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological and includes ten categories for same [1]. Majority of waste (75-90%) produced by the healthcare providers is non-risk or general and it is estimated that the

remaining (10-25%) of healthcare waste is regarded as hazardous the potential for creating a variety of health problems [2].

Bio medical waste collection and proper disoposal has become a significant concern for both the medical and general community [3]. Among all health problems, there is a particular concern with HIV/AIDS, Hepatitis B and C, for which there is a strong evidence of transmission through healthcare waste. The BMW rule applies to all those who generate, collect, receive, store, transport, treat, dispose or handle BMW in any manner and also to every institution that generate BMW. The bio medical waste should be segregated at source into color coded bags or containers and its collection and proper disposal should be a significant concern for both medical personnel and general communtiy [3].

The waste produced in the course of healthcare activities carriers a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well. However, lack of awareness has led to the hospitals becoming a hub of spreading disease rather than working toward eradicating them. It is estimated that anually about 0.33 million tonnes of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day [4].

Effective management of biomedical waste is not only a legal necessity but also a social responsibility. Hence, there is a need for resource material to help administrators, doctors, nurses and paramedical staffs. The purpose of BMW are mainly to reduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection and improves safety for employees working in the system. For

this, a conscious, coordinated and cooperative efforts has to be made from physicians to ward boys [5]. The present study was conducted with objective to know the knowledge, attitude and practice among health care personnels working in a P D U Government Medical College, (tertiary care centre) Rajkot.

MATERIAL AND METHODS

The study was conducted at P D U Government Medical College and Civil Hospital, Rajkot. The institute is a tertiary care centre serving not only the Rajkot city and district, but also the other districts of Saurashtra region. Patients are visiting the present institute from different surrounding districts like Junagadh, Probandar, Jamnagar and Kutch. The study was conducted from January 2013 to June 2013. It was a descriptive observational hospital based cross sectional study. Study participants included the resident doctors intern doctors, nursing staff, laboratory technicians, ward boys and sweepers working in the institute who are dealing with BMW. The study was conducted by using pretested, semi-structured proforma.

The study included details of various socio-demographic variables, like age, sex, educational status, working experience, type of work, and other details regarding knowledge, attitude and practice for bio medical waste handling and its management. All the resident doctors, intern doctors, nurses and other health staff was invited individually to participate in the study after giving the informed consent. All the study participants were assured about their confidentiality and anonymity. Total 282 health care personnel participated in the present study. It included 123 resident doctors and interns, 92 nurses, 13 laboratory techinicians, and 54 sanitary staff. The data was tabulated and interpretation was done by using percentages through Epi Info 3.5.1 software.

RESULTS

Total 282 health care personnel

Table 1: Basic profile of health care study population

Characteristics	Number (n=282)	Percentage
Age		
21-25 years	67	23.76%
26-30 years	105	37.23%
31-35 years	36	12.76%
36-40 years	32	11.34%
> 40 years	42	14.89%
Sex		
Male	119	47.20%
Female	163	57.80%
Working status		
Doctors (residents & interns)	123	43.61%
Laboratory technician	13	4.61%
Nurses	92	32.62%
Sanitary staff	54	19.15%
Working in hospitals since		
< 1 year	1	0.35%
1-5 years	191	67.73%
6-10 years	52	18.43%
> 10 years	38	13.47%
Received any training for BMW management		
Yes	124	44.29%
No	158	56.03%
Diseases transmitted by Bio Medical Waste		
HIV	210	74.47%
Hepatitis B	158	56.03%
Tuberculosis	24	8.51%
Infectious diseases (Others)	150	53.19%
Hepatitis A	30	10.64%

participated in present study. The study participants included age range of 21-44 years. Out of 282, mainly 123 study participants were resident and intern doctors, 92 nursing personnel, 13 laboratory technicians and 54 sanitary staff were included (table 1). Majority of study participants belongs to 21-30 years (61%) age group. More than two third of study participants working in hospital from 1 to 5 years. Only 44.3% study participants received training for bio

medical waste management. HIV (74.47%), Hepatitis B (56.03%) were the main infectious diseases transmitted by the bio medical waste.

Awareness about bio medical waste management and other particulars related to BMW act, handling and management were presented in table 2. It included about details of categories of BMW, any health hazard, transmission of disease by BMW, received any training for BMW, knowledge about color coding of BMW management bags, identifies the correct color of bag for different categories.

Detailed information was collected regarding practice of BMW handling and management (table 3). Details regarding record of BMW, disinfection at work place, use of personal protective measures for handling, storage facility, availability of hub cutter, practice regarding different categories disposal were collected from the health care personnel.

DISCUSSION

The present study was conducted among health care personnel of different level working at a tertiarycare hospital. The study participants included resident & intern doctors, nursing staff, laboratory technicians and sanitary staff. Total 282 health care personnel participated in the study. Majority participants heard about the BMW and its management rule but less than half of the study participants have actually received training for BMW management. Only 40.4% study participants knows correct categories of BMW. Though overall knowledge of study participants was good but still they need good quality training to improve their current knowledge about BMW. The present study findings are in agreement with other study [6], but in contrast to study conducted in other area of Gujarat state [7]. Emphasis should be given to good quality training of health care personnels working in the hospitals at regular time interval [8, 9].

Table 2: Awareness about Bio Medical Waste (BMW) and its management among health care personnel

Awareness	Yes No. (%)	No No. (%)	P value	95% CI
Heard about Bio Medical Waste (BMW)	269 (95.4)	13 (4.6)	1.24	92.9-97.9
Heard about BMW Rule/Act, 1998	145 (51.4)	137 (48.6)	2.97	45.5-57.4
Received any training for BMW management	126 (44.7)	156 (55.3)	2.96	38.8-50.6
Know about Bio Hazard Symbol	247 (87.6)	35 (12.4)	1.96	83.7-91.5
Is present hospital generates BMW	272 (96.5)	10 (3.6)	1.10	94.2-98.7
Know all BMW management categories	114 (40.4)	168 (59.6)	2.92	34.6-46.3
Is any BMW management disposal policy there in present hospital	244 (86.5)	38 (13.5)	2.03	82.5-90.6
Any health hazard associated with BMW	274 (97.2)	8 (2.8)	0.98	95.2-99.1
Is BMW transmits any disease	251 (89.0)	31 (11.0)	1.86	85.3-92.7
Are different coloured bags used to dispose BMW	272 (96.5)	10 (3.6)	1.10	94.2-98.7
Regular educational program/training needed for BMW	252 (89.4)	30 (10.6)	1.83	85.7-93.0
Any guideline provided for colour coding at work area	229 (81.2)	53 (18.8)	2.32	76.6-85.9
Identified all coloured bags used for BMW collection	238 (84.4)	44 (15.6)	2.16	80.1-88.7
Identified methods for BMW management	233 (82.6)	49 (17.4)	2.25	78.1-87.1

Table 3: Practice of health care personnel regarding Bio Medical Waste (BMW) and its management

Practice	Yes No. (%)	No No. (%)	P value	95% CI
Maintaining BMW records at work place	210(74.5)	72(25.5)	2.59	69.3-79.7
Segregation of BMW done at work place	245(86.9)	37(13.1)	2.01	82.9-90.9
Disinfection of BMW done before disposal at work place	239(84.8)	43(15.2)	2.14	80.5-89.0
Using personal protective measures while handling BMW	239(84.8)	43(15.2)	2.14	80.5-89.0
Personal protective measures procured for handling BMW	235(83.3)	47(16.7)	2.21	78.9-87.8
Proper storage facility provided for collecting BMW at work place	247(87.9)	34(12.1)	1.93	84.0-91.8
Provided with hub cutter for needles and syringes	245(86.9)	37(13.1)	2.01	82.9-90.9
Any record available for injuries related to BMW	49(17.4)	233(82.6)	2.25	12.9-21.9
Know the place where BMW treated	123(43.6)	159(56.4)	2.95	37.7-49.5
Practicing correct method for collecting used disposable plastic items	226 (80.1)	56 (19.9)	2.38	75.4-84.9
Practicing correct method for collecting soiled dressings/plaster casts/linen	187(66.8)	93(33.2)	2.80	61.2-72.4
Practicing correct method for collecting sharps and needles	178(63.1)	104(36.9)	2.87	57.4-68.96
Practicing correct method for collecting human anatomical waste	199(70.6)	83(29.4)	2.71	65.1-76.0

Overall assessment about practices related to BMW management suggested that they again need good quality training.

The concept about the maintenance of records related to injuries due to BMW is not prevailing very much. Similar findings

were observed in other study also [8,10]. Low reporting of injuries may be attributed to the fact that most of the doctors and other technical and nontechnical staff are unaware about a formal system of injury reporting which should be established within all the health facilities.

To improve overall knowledge and practice related to BMW management and its handling following steps can be taken [8] like, strict implementation of bio medical waste management rules; it should be made compulsory for health care facilities to get their health care personnel trained from acredited training centres, these training centres should not become merely a one time activity but should be a continuous process depending upon the patient input in different health care facilities; training of sanitary staff should be specially emphesized; it should be ensured that the injuries happening to the health care personnel are reported to the person in charge of bio medical waste management or to the bio medical waste management committee, and they report it in the prescribed format to the pollution control board.

CONCLUSION

Based on the observation, the importance of training regarding bio medical waste management cannnot be overemphasized, lack of proper and complete knowledge about bio medical waste management impacts practices of appropriate waste disposal.

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